

Leveling survey of the Imperial  
Valley Mekometer network

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Ronald G. Mason  
Geology Department  
Imperial College  
London SW7 2BP, England  
(011-4471) 589 5111

Investigation

This project involves (1) leveling the main block of the existing high precision edm network to first order accuracy, and (2) extending the network, and the measurements, to provide better coverage of the Imperial fault and Brawley seismic zone north of their junction (Figure 1). This will be the first leveling in the network. It will produce no immediate scientific return, but it will enable future movements of the ground surface to be monitored in three dimensions.

Results

During this reporting period twelve weeks were spent in the field, and the program is now almost complete. More than 170 stations in the main block, and fifty new stations in the extensions, have been leveled, involving almost 400 km of leveling line in all (Figure 1). Connections have been made to five NGS benchmarks occupied repeatedly by GPS during the past few years, and to numerous other NGS benchmarks. Preliminary assessment of the results indicates a standard error of about two mm, which satisfies the criterion of first-order accuracy.

It was not part of the original program to make horizontal measurements. However, because of impending GPS occupation of a major part of the main block by Yehuda Bock of IGPP, La Jolla, it was decided to measure the lengths of all previously measured fault-crossing lines. Though less accurate than the Mekometer, the Kern DM503 edm used will enable horizontal coordinates derived from the most recent (1987) Mekometer measurements to be updated with sufficient accuracy for a meaningful assessment to be made of the GPS results in all three dimensions.

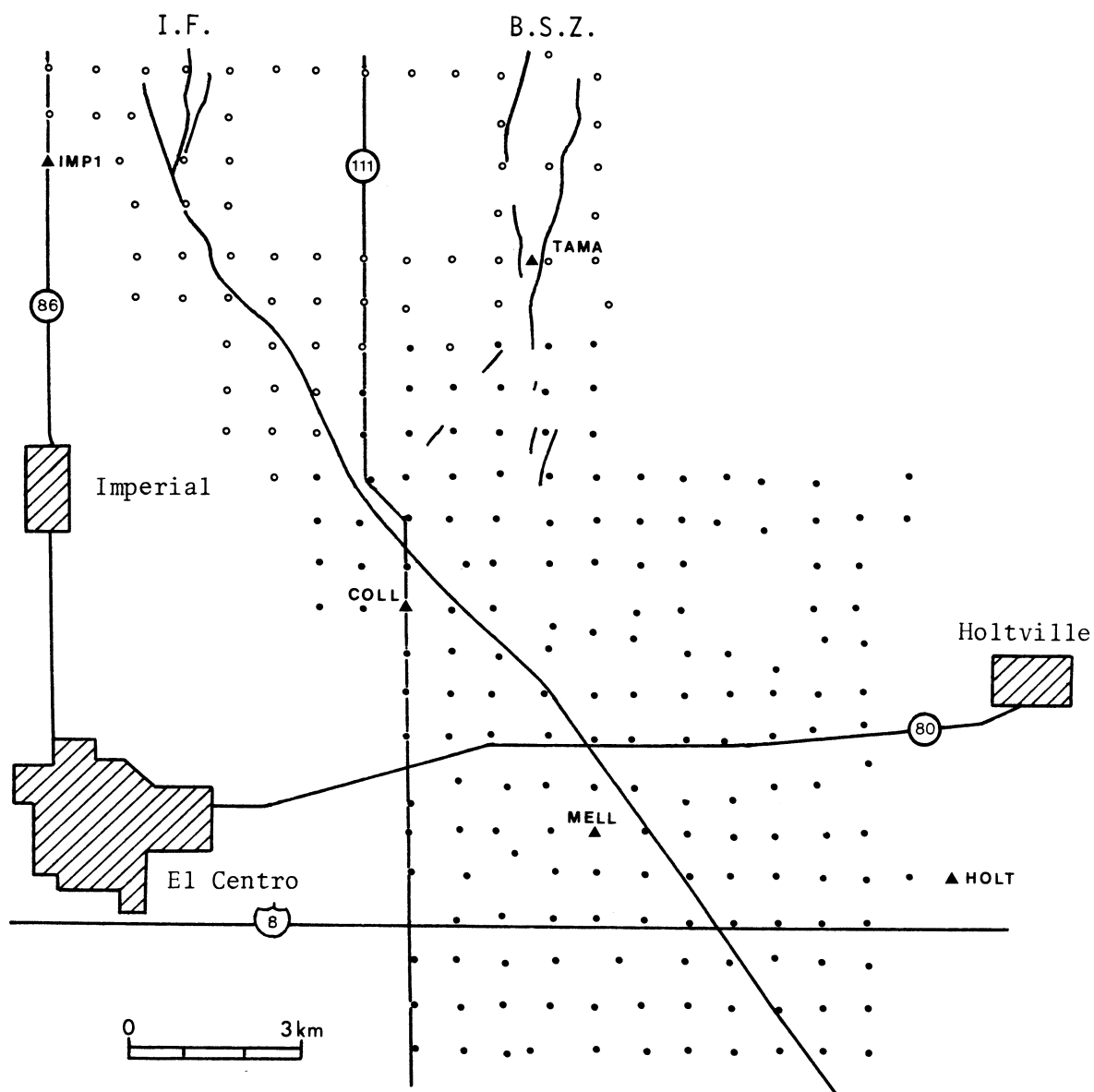


Figure 1. Stations to be leveled in 1991. Closed circles show existing Mekometer stations, for which 1987 horizontal coordinates are available, and open circles planned new stations. Connection will be made to the five NGS benchmarks indicated by solid triangles.